Remarks/Arguments

Reconsideration of this application, as amended, is respectfully requested.

Paragraph **[0020]** has been amended to correct reference numeral and typographical errors.

Claims 1, 3-9 and 11-5 are pending in this application.

Claim 3 has been amended to depend from claim 1.

Claims 1, 3, 4, 9, 11 and 12 are under a rejection based on 35 U.S.C. 103(a) as being unpatentable over Lehde (U. S. Patent No. 2,996,162) in view of Moskowitz et al. '818. It is respectfully submitted that this rejection is in error as the proposed combination would not have been obvious to one skilled in the art at the time the invention was made.

Specifically, among other structure, claims 1 and 9 each set forth a known environment including a gear box having a low section (cl. 1) or well (cl. 9) provided with a bottom wall, a drive shaft extending through the bottom wall and coupled to gearing, and a seal located for preventing oil from leaking along the surface of the shaft where it enters the gear box. In combination with this known structure is claimed a contaminant collector having a magnetic characteristic and being mounted in the gear box for rotation with the drive shaft at a location above and closely adjacent a top surface of the seal so as to intercept and collect ferric contaminants before they engage the seal.

Lehde discloses (FIG. V) a magnetic coupling arrangement including an input shaft 26 and an output shaft 37, with the shaft 37 being selectively coupled for rotation with the shaft 26 by energizing a coil 38 which causes an oil/magnetic particle mixture c, contained within a cavity defined by members fixed for rotation with the shaft 26 and with it forming part A', to "partly solidify and thereby produce a coupling torque between the parts A' and B' which is proportional to the current flow to the coil 38", with part B' being formed by the output shaft 37 and a plate 36, 36' joined to one end of the shaft 37 and located within the cavity containing the oil/magnetic particle mixture. The part A' includes a bearing housing 31 coupled for rotation with the shaft 26 and mounted for rotation about the shaft 37 by inner and outer bearings 33 and 34. A bearing seal 35 is located within the cavity containing the oil/magnetic particle mixture c and is sandwiched between the inner bearing 33 and a toroidal magnet 60 encircling the shaft 37 and mounted within a recess formed

in an inner end of the bearing housing 31 so that a planar face 61 of the magnet 60 is exposed in its entirety to the oil/magnetic particle mixture c. The radially inner part 36' of the disc 36, 36' is provided with a magnetizable axial surface 62 facing the surface 61 of the magnet 60, this magnetizable surface 62 being provided with a spiral ridge formation 63. A planar axially facing surface of the disc 36, 36', which is on an opposite side of the disc from the spiral ridge formation 63, is spaced slightly from a planar surface of a member 27 fixed to an end of the shaft 26 so as to form a radial passage 30 that is connected to an opposite side of the disc through a neck passage 30" formed between the outer periphery of the disc 36, 36' and the coil 38, the neck passage 30" being coupled to a base passage 30' defined between the magnet surface 61 and the spiral ridge formation 63. During operation, the surface 61 of the toroidal magnet 60 cooperates with the spiral ridge formation 63 such that magnetic particles migrating from the radial passage 30 into the base or gap passage 30' are driven by the spiral rib formation 63 from the base passage 30' ad away from the neck portion of the shaft 37 which is adjacent to the baring seal 35.

Moskowitz et al. disclose a variety of embodiments of dynamic lip seals 32 which are located in fixed relationship to a rotatable shaft 10. The lip seal may itself be made from materials to form a permanent magnet, or a separate permanent magnet may be used with the lip seal in such a way that ferrofluid is retained at the lip of the seal so as to lubricate the wear region and exclude particulate contaminants, especially those which are non-magnetic from the wear region. Thus, it is clear that the magnets in these embodiments do not act to **collect contaminants**, but rather act to attract the ferrofluid, with the ferrofluid acting to exclude other fluid and particulate contaminants from the seal region. This ferrofluid may be painted onto the shaft 10 and the radial lip 32 or be provided within porous foam forming part of the seal assembly, as shown in FIGS. 15 A and 16, for example. In FIGS. 13A, 13B and 13C respective embodiments are shown which utilize separate magnets that are fixed for rotation with the shaft 10.

It is clear that the flowable magnetic material c disclosed by Lehde and the ferrofluid disclosed by Moskowitz et al. are vastly different materials and that the principles of operation of the two are much different. Specifically, Lehde does not want any magnetic particles of the flowable magnetic material c to find their way to the interface between the shaft 37 and the seal 20, while Moskowitz et al clearly want the ferromagnetic material to be located at the interface between the shaft 10

and the lip of the seal 32. Further, it is clear that neither Lehde or Moskowitz et al. are directed to the idea of **collecting contaminants with a member having a magnetic characteristic** as is the case with applicant's claimed structure. In Lehde, the magnetic particles are **conveyed away** from the seal 35 while the oil part of the mixture is permitted to provide lubricant for the seal 35. In Moskowitz et al. the magnet acts to retain the ferrofluid in place so that contaminants are excluded from the seal interface with the shaft due to the fact that the interface is already occupied by the ferrofluid.

Accordingly, since the magnet 60 in Lehde works in conjunction with the spiral ridge arrangement 63 to convey magnetic particles away from the seal 35, while permitting oil to flow to the interface between the seal 25 and the shaft 37 and the magnets in Moskowitz et al. are used for the purpose of attracting the ferrofluid to the lip of the seal 32, it is not seen how it would have been obvious to one skilled in the art to have modified Lehde by mounting the magnet 60 for rotation with the shaft 37, instead of with the shaft 26, as shown, since no advantage occurs. Furthermore, mounting the magnet 60 for rotation with the shaft 37 still doesn't result in applicant's claimed structure since the magnet 60 **does not collect** contaminants, as claimed.

Accordingly, base claims 1 and 9 are thought allowable. Since claims 3 and 4 depend from claim 1, and claims 11 and 12 depend from claim 9, they too are thought allowable.

The Examiner has indicated that claims 5-8 and 11-16 contain allowable subject matter. Since claims 5-8 depend indirectly from claim 1, and claims 11-16 depend indirectly from claim 9, they too are thought to be allowable

In conclusion, it is believed that this application is in condition for allowance, and such allowance is respectfully requested.

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Respectfully,

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